



One of several bays along south edge of Carson Sink showing part of the 140,000 acres flooded this year. Carson Sink is normally dry. Airthrust boat left center.

DOMESTIC SERVICE	
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FULL RATE TELEGRAM	SERIAL
DAY LETTER	NIGHT LETTER

WESTERN UNION

JOSEPH L. EGAN, PRESIDENT

1200

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Send the following message, subject to the terms on back hereof, which are hereby agreed to

January 30, 1953

Regional Director
Fish and Wildlife Service
Saan Island
Portland 12, Oregon

RETEL NARRATIVE REPORT MAILED THURSDAY. YOU SHOULD RECEIVE IT MONDAY.

Leroy W. Giles (1-2)

CLASS OF SERVICE

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WESTERN UNION

W. P. MARSHALL, PRESIDENT

1201

SYMBOLS

DL = Day Letter

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TFO 0 D014 GOVT PD WUX SAN FRANCISCO CALIF 30 123P

LEROY GILES STILLWATER REFUGE

FALLON NEV=

WHEN MAY WE EXPECT RECEIVER SEPTEMBER-DECEMBER 1953

NARRATIVE REPORT /QM/ =

MCDONALD 1-R FWS, PORTLAND OREGON=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

NARRATIVE REPORT

STILLWATER WILDLIFE MANAGEMENT AREA

SEPTEMBER - DECEMBER
1952

PERSONNEL

LeRoy W. Giles	- - - - -	Refuge Manager
David B. Marshall	- - - - -	Biologist
Illa E. Cress	- - - - -	Clerk (Typing)
Arthur V. Huff	- - - - -	Super. Automotive Mechanic
Marnel Olano	- - - - -	Automotive Mechanic (General)
William H. Ogden	- - - - -	Automotive Mechanic (General)
Earl W. Nygren	- - - - -	Maintenance Supervisor

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I GENERAL

A. Weather Conditions

Included in our extracurricular reading material is the "Farm Journal". We read this magazine not only for the opportunity of enjoying the pictures of choice steak on the hoof but also because the magazine occasionally contains ideas useful in refuge management. One of the recent innovations carried by the "Farm Journal" is a 30-day weather outlook as predicted by the well known rain maker and weather prognosticator, Irving P. Krick. We have followed this column with interest and find, so far, that the man has been remarkably accurate. The forecast for November was colder than normal and dry. After living through the month we were ready to agree, while a check of the records further confirmed the prediction. The mean temperature was 5 degrees below normal while the rainfall was only half of normal. Krick's prediction for December was warm and stormy. He missed this slightly, but his basis for prediction was okay. December was 3 degrees warmer than normal. It was also stormy, however, the storms were limited to wind and cloud cover. Most of the rain fell in the Sierras. December had only 8 clear days compared to an average of about 14.

Long range predictions, such as the "Farm Journal" carries, could be very useful as a basis for scheduling refuge work programs. The Stillwater work program this fall has not been too flexible, but some schedule shifts were planned in the event that weather disrupted the normal program. The stormy weather in December did not disrupt our work schedules because there was no excessive precipitation. The prediction for December, however, did give us a chance in advance to prepare for what could have been a bad time.

<u>Month</u>	<u>Precip.</u>	<u>Miles of Wind</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>	<u>Mean</u>	<u>Evap.</u>
September	.68	1,044.7	92	37	63.4	4.51
October	.04	490.0	88	29	55.5	4.23
November	.16	844.4	69	6	34.9	1.40
December	<u>.74</u>	<u>1,628.3</u>	<u>56</u>	<u>8</u>	<u>34.4</u>	<u>frozen</u>
Totals	2.41 1.62	5,678.4	94	8	46.6	10.39
46 Year Average	1.90	6,248.0	92.2	3.3	45.9	11.47

B. Water Conditions

Water inflow remained high until the last 2 weeks of December instead of tapering off toward the end of the irrigating season and then dropping rapidly as might be expected. At the close of the irrigating season, November 15, inflow was greatly increased as a result of the diversion of power water from the Carson River to the larger drains. The Truckee-Carson Irrigation District dried up the lower river in order to make repairs to Sagouspe Dam. Approximately 200 second feet of water were diverted into the Stillwater Marsh. This flow was finally cut off on November 29 after which the volume of water received began dropping toward the normal winter low.

The entire calendar year of 1952 has been characterized by high water conditions. Marsh water levels have remained high and much of the low-lying peripheral lands have been inundated. The expected summer recession for all practical purposes did not occur. Increased water flow through all of the main line structures undermined the riprap so that practically all of it had to be replaced. The high water resulted in excessive dike erosion and also hampered the work program. Approximately a mile of the 3-mile long Lead Lake Canal was under water during the period of excavation - a condition which was not expected. Similar difficulties were encountered in construction of the North Road where dragline or carryall had to be substituted for the elevating grader on wet or inundated ground.

High water also had a pronounced effect on waterfowl populations. The greater spread of the water doubled the amount of shoreline available to puddle ducks so that production of these species showed a marked increase. On the other hand, the increased depth of water inhibited the growth of sago pondweed with a consequent decrease in the supply of this food which is preferred by our diving ducks. This probably was responsible, in part, for the decline in redhead numbers.

The following tabulations will serve to illustrate marsh water conditions during 1952. Because these conditions have remained abnormal throughout the year, we feel that the summary will be of more value as a reference if data for the entire year are used rather than for the period alone.

Table I - Volume of outflow from Stillwater Point Reservoir compared to the average of previous years. The Reservoir is not the only source of marsh water, but it is the only point where inflow is being recorded. Approximately two-thirds of the marsh water supply is received via the Reservoir.

Table I

<u>Month</u>	<u>Normal Volume of Discharge</u>	<u>Discharge in 1952</u>	<u>Percent Increase</u>
January	1739*	3439	98
February	1243*	3527	184
March	1230*	3407	177
April	1822	8355	359
May	4488	9571	113
June	5783	8031	39
July	5883	10160	73
August	5963	8380	41
September	5123	6785	32
October	3995	7133	79
November	3189	6901	116
December	<u>2799</u>	<u>7946</u>	<u>184</u>
Totals	43257	83635	93

*Revised average based in part on inflow data obtained from Bureau of Reclamation and corrected for evaporation loss from Stillwater Point Reservoir.

Table II - Marsh pool levels for 1952 expressed in monthly averages. The series of levels for Swan Lake is based on measurements made at Structure No. 16 which is in the center of the public shooting area. The series constitutes the only good record we have of water elevations within the big marsh.

Table II

<u>Month</u>	<u>Reservoir</u>	<u>Foxtail Lake</u>	<u>Pool 3889</u>	<u>Pool 3885</u>	<u>Pool 3877</u>	<u>Swan Lake</u>
February	3907.9	3890.5	3888.5	3882.4		3877.0
April	3908.2	3889.7	3888.6	3882.3		
June	3908.2	3889.7	3888.9	3883.7	3877.4	3876.5
July	3907.9	3889.5	3888.7	3883.8	3877.4	3876.6
August	3907.6	3889.2	3888.5	3883.5	3877.4	3876.5
September	3908.1	3889.1	3888.4	3883.5	3877.3	3876.5
October	3908.5	3889.1	3888.4	3883.5	3877.9	3876.6
November	3908.6	3889.2	3888.5	3883.6	3877.4	3876.7
December	3907.6	3889.3	3888.6	3883.8	3877.4	3876.8

C. Fires

None

II WILDLIFE

A. Migratory Birds

1. Population and Behavior

The accompanying graph and tables tell most of the story on waterfowl populations for this period. In general, it can be said that duck numbers ran considerably above those recorded since the first regular censuses for the Area in 1949. This record number of ducks seemed not only true for the Management Area, but for the entire Lahontan Valley as well. Our master population graph shows the fall duck migration here has two peaks. In 1950 and 1951 the first peak occurred during the third week of August and the second peak came the last week of October. This year the first peak occurred the first of September and the second about November 7th or in both cases around two weeks later than usual. Roughly, 40% of the first peak was made up of pintails plus another 16% shovellers while the second peak was 32% shovellers and only 20% pintails. As in the past, roughly twice as many ducks were represented by the second peak as by the first. The first peak, however, is the one that hits farmers of this area and creates a crop depredation problem that appears to be growing by leaps and bounds, at least insofar as complaints are concerned.

Like last year, this year's migrating species had to do without the Nutgrass Unit and Big Water which were dry. However, the flooded Pelican Island Marsh more than made up for the concentration usually found in the former areas. This was unfortunate because of the botulism outbreak that lasted into November at Pelican Island. As in 1951, a second major concentration point was the south end of the Stillwater Point Reservoir. The reservoir concentration accounts for most of the refuge usage. It serves little more than a resting area for birds that feed on nearby farmland.

The practice of censusing the Area in four sections was continued. Last year the refuge averaged 33% of the ducks per census. This year even with the longer hunting seasons, the refuge average was only 29% of the ducks per census. The open hunting portion of the Stillwater Marsh averaged 34% of the ducks per census this year as compared to 46% last year while the Indian Lakes area came up with only 5% as against 10% last year. Pelican Island made up for the smaller percentage of ducks elsewhere with an average of 32% of the ducks per census as compared to only 11% in 1951. In actual duck use days, Pelican Island came out on top this year with 40% of the total duck use days for the period despite the successful herding that was carried out there as a botulism control measure. The relative productivity of Pelican Island in duck use days this period was over five times that of Stillwater on a basis of acres of habitat flooded. Stillwater, refuge and hunting sections combined,

Thousands

80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5

DUCK POPULATION TRENDS

1950
1951
1952

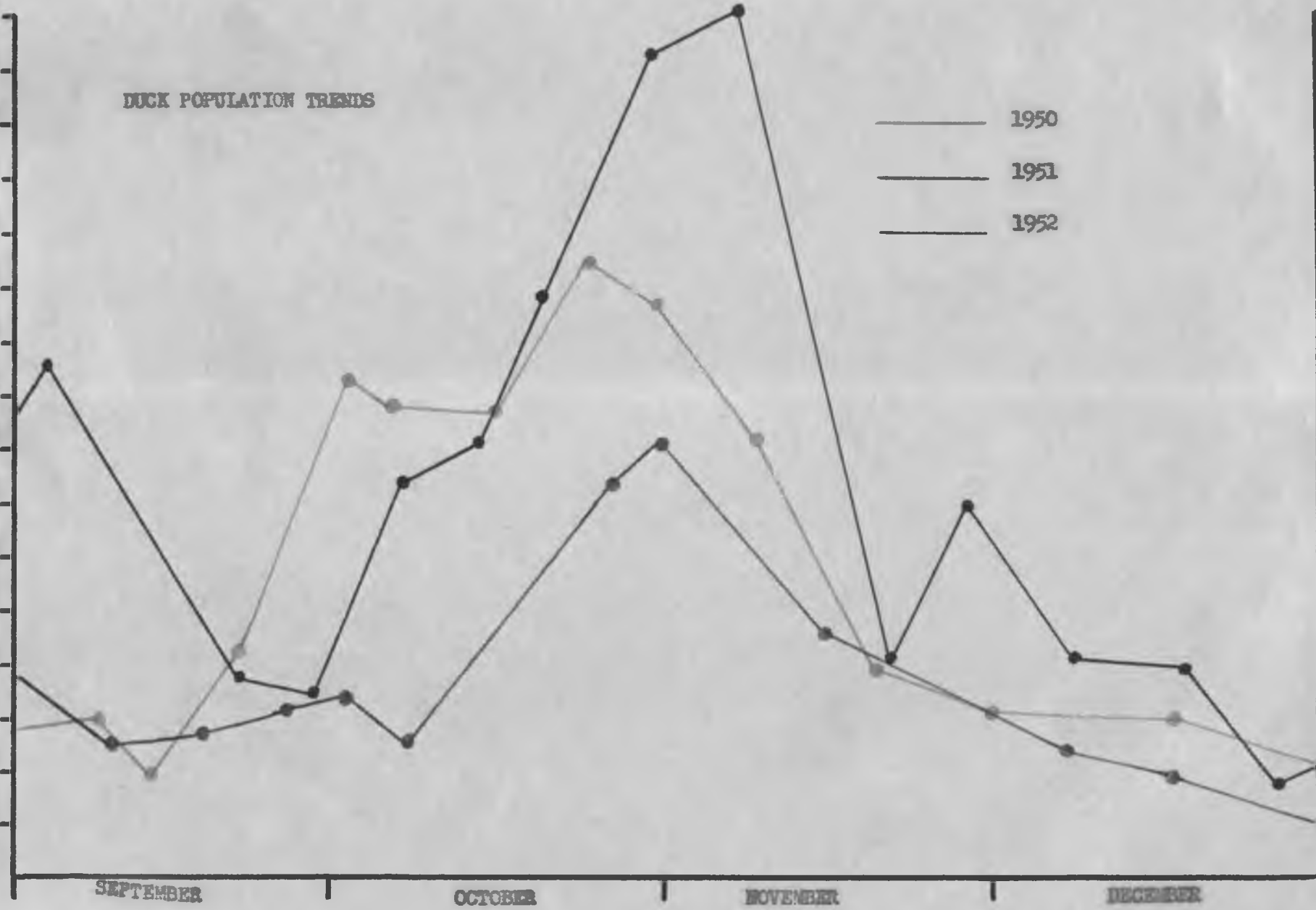


Table III - Percent of total duck population found on the four Stillwater Wildlife Management Area census areas on each census taken this period. Waterfowl hunting season began October 17, and ended December 25. As shown, during hunting season, refuge population was roughly one and one-half to three times as large in proportion to total population.

Date	Refuge	Open Hunting Area			Total Population
		Stillwater	Pelican Island	Indian Lakes	
9/4	3%	31%	65%	1%	47,400
9/22	20	41	28	11	18,700
9/29	12	51	23	14	16,800
10/7	27	54	12	7	36,800
10/14	10	59	25	6	40,200
10/20	69	11	18	2	54,300
10/30	30	16	53	1	76,400
11/7	27	21	50	2	80,200
11/21	31	24	37	8	18,900
11/28	61	26	12	1	34,700
12/8	35	51	9	5	20,300
12/18	37	22	39	2	19,500
12/27	20	31	43	6	8,700

Table IV - Waterfowl use days for the four Stillwater Wildlife Management Areas expressed to the nearest percent of the total use days for the groups shown.

	<u>Swans</u>	<u>Geese</u>	<u>Ducks*</u>	<u>Coots</u>
Refuge	18%	45%	29%	9%
Open Hunting Area				
Stillwater	35	20	28	69
Pelican Island	46	35	40	18
Indian Lakes	1		3	4
Total Use Days	102,291	403,024	4,867,288	2,719,461

* Excluding mergansers

supported 160 duck use days per acre of habitat while Pelican Island supported 855 duck use days per acre of habitat.

In 1950 the bulk of the fall migration consisted of pintails while in 1951 it was shovellers. This year, shoveller and pintail use was about equal. These two species accounted for approximately half the duck use days.

Canada goose population were generally up while the reverse was true for the snow goose. Coot numbers continued the upward trend which was discussed in the last narrative.

Shorebirds took advantage of the Pelican Island Marsh and Carson Sink in usual numbers while use of the Area by other waterbirds seemed to follow the normal pattern.

More specific data, by species, follow:

Whistling Swan. As compared to the drop of last year, swan numbers were higher this year than any previously recorded year. The first swans arrived as usual the last of October. The peak occurred in December with over 4,000 swans estimated to be present as against only 700 last year and the highest previously recorded peak of 2,000 in 1950. As shown in Table IV, nearly half the swan use days occurred at Pelican Island. At Stillwater, the swans concentrated at specific ponds which had relatively shallow water and produced sago pondweed this past summer.

Canada Goose. Whereas honker numbers ran from 580 to 1200 last year for this period, they varied from 300 to 3100 this year. Their concentration areas were the same as last year with a greater use being made of Pelican Island. Stillwater Marsh hunters don't get much of a chance at them unless they hunt in privately owned farmland surrounding Stillwater where the refuge honkers feed.

White-fronted Goose. No white-fronts were recorded in the field, but one taken by hunters was checked through the checking station on November 23 and another on December 21.

Snow Goose. Peak snow goose numbers were above 1950 but below the 10,000 of 1951. However, in 1951, no snow geese were seen after November 15 whereas, this year substantial numbers remained through the period. These birds concentrated on the Stillwater Point Reservoir, Foxtail Lake, Dry Lake, Pintail Bay and Pelican Island. The Pintail Bay concentration, which was not present last year, gave hunters a chance which they did not previously have for getting snags.

Ross Goose. Two were picked up sick from botulism at Pelican Island on November 2. A few of these birds are shot by hunters in the Lahontan Valley each fall, but so far we have failed to identify any that weren't in-the-hand.

Mallard. This year's mallard peak jumped up for the fourth successive year. Each year a few more concentrate on the Stillwater Point Reservoir during the day and feed off of nearby farmers from dusk to dawn. The mallard accounted for 17% of this period's duck use days.

Gadwall. Gadwall use days ran less than 5% of the total duck use days, but their numbers were up from last year.

Baldpate. Although we had more of this species this year than last, the peak never reached that of 1950, when 20,000 were present at one time. This year's peak reached only 5,000 and last year's peak was 1,350. The baldpate accounts for only 5.6% of this period's duck use days.

Pintail. The pintail ranked just under the shoveller with 25.6% of the total duck use days. The pintail peak occurred at the time of the October 30 census with 21,800 birds, which is quite similar to the peak of 20,250 recorded on October 31 of last year. In actual duck use days, however, this year's total is considerably above that of last year. Pintails take to the Pelican Island marsh more readily than to Stillwater.

Green-winged Teal. Numbers of this species ran considerably above last year. In duck use days, green-wings came in fourth with 14.5% of the total.

Cinnamon Teal. Our number one nester for this past nesting season had departed by the end of November. Their numbers dropped from 6,150 on September 4 to less than 1,000 at the end of the month so that this species contributed only 3% of the total duck use days for the period.

Shoveller. Every fall we get more spoonies. In fact at times it seemed like that's all the open hunting area had to offer. This year's peak reached 26,300 on November 7; 1951's peak reached 19,000 on October 22; the 1950 peak was 5,500 and the 1949 peak only 1,000. The shoveller was number one duck in use days with 27% of the total.

Redhead. By the first of the period, this species had practically abandoned us with less than 1,000 being present. Although the redhead accounted for only .7% of the duck use days, 6% of the ducks taken by hunters in the Stillwater Marsh were redheads. Presumably these are the young of late, or re-nesters, as a few that can barely fly are found scattered through the marsh after the main flocks leave the Area. These provide an easy target for hunters.

Ring-necked Duck. One was checked through the checking station on November 9 and another on November 16. No others were seen.

Canvasback. Cans showed up in substantial numbers unusually early this year and reached a peak of 1,400 by the end of October, the same time as last year's peak. They account for but 1.3% of the duck usage. Their use is almost entirely restricted to the Stillwater Marsh where they often occurred in several big flocks in association with swans. Actual canvasback usage was slightly up this year over the previous three years.

Scaup. American Golden-eye and Bufflehead. These three species combined accounted for only .1% of total duck usage.

Ruddy Duck. Ruddy numbers were up, but still did not reach 1000. Use days amounted to less than 1% of the total.

American Merganser. This bird, as usual, did not appear until the end of the period. Over 1000 were noted just outside the Area boundary in the Carson Sink on December 27.

Coot. Coot peaks for this period since 1949 stand as follows:

9/28/49 -	7,500
9/15 & 22/50 -	14,000
9/19/51 -	30,500
9/4/52 -	45,400

This office would rather see this trend go the other way. Our waterfowl food problem was discussed at length in the last narrative. The coot takes a good proportion of the food that would otherwise go to ducks, yet their value here seems nil. The number taken by hunters from the Canvasback Gun Club and Stillwater Marsh combined was probably less than 100. The 45,400 figure shown above is the largest number of coots yet recorded by us here. Of the total waterfowl use days for the Area, the coot accounted for 34% of them. Their distribution in the four sections of the Area was approximately equal to the acreages involved.

Grebes. The usual migration of eared grebes passed through the Area in September and October. Western grebes disappeared altogether after November 7, whereas a few usually hang on.

Pelicans and Cormorants. Unusually large numbers of white pelicans frequented the Area the first half of the period. One flock of about 500 fished Pelican Island Marsh while others used Stillwater, including the sand dune area north of Pintail Bay. Unlike the last two years, no pelicans remained into December, but at least one double-crested cormorant chose to stick with us this far into the winter. None were seen last year after November 7.

Herring, Kittiwake, Puffin and Loon. The birds under this group either move out altogether or decline in numbers as winter

approaches. Numbers were about the same as last year, but a white-faced glossy ibis flock was seen as late as November 7. Snowy egrets were also seen on this date, which is a month later than last year. A least bittern was seen in a clump of hardstem bulrush at Pelican Island on September 25. In our last narrative we failed to mention a small snowy egret rookery which existed the past nesting season in hardstem bulrush at Pelican Island. Indications are that a few white-faced glossy ibis nested there also.

Shorebirds. The only real shorebird area for this year was the Carson Sink shore and Pelican Island Marsh. Here the large flocks of peeps, dowitchers, avocets and northern phalaropes were present in September and October along with small numbers of marbled godwits, killdeers, and greater yellow-legs. A rare find for so late in the season was two willets on December 20.

Gulls and Terns. The usual small flocks of ring-billed gulls inhabited various parts of the Area. Terns were virtually gone by the first of the period.

2. Food and Cover

The general decline in the waterfowl food supply of the Stillwater Marsh was covered at length in the previous narratives. The general excellence of food conditions at Pelican Island was likewise discussed. There seems no need to repeat the same statements here. The only addition that appears worth mentioning was the use of the East Pasture this period by both snow and Canada geese for grazing purposes. At the most, only 200 Canada geese used the pasture, but they stayed with it until they had grazed off over 200 acres of fall grain. Duck use of the pasture was insignificant.

3. Botulism

The botulism outbreak at Pelican Island and the Carson Sink at long last finally came to an end.

A summary of the epidemic had best begin with a statement of losses that occurred. These losses are based on sample counts of dead birds made along measured segments of the shoreline and from measured transects run across the water area. Some of the first estimates on losses had to be revised upward, as it was found that carcasses in the water became disintegrated and submerged sooner than expected. Final duck and goose losses amounted to around 27,000 birds. An estimated 1,700 birds of other species were also lost.

The outbreak began about July 1, at which time losses averaged 55 ducks per day. Between July 9 and July 25 total loss

was about 100 birds. Between July 26 and August 13 an estimated 2,500 ducks were lost with an approximate 132 per day average. In the next 14 days, between August 14 and August 27, losses averaged 215 birds per day. In the period between August 28 and September 16, an average of 700 ducks per day died, over three times the average for the previous two weeks. On September 17 herding operations began. Losses suddenly dropped to less than 100 per day. This cannot be entirely attributed to herding, however, as the duck population took a drop at this time. During the remainder of the epidemic, losses averaged about 115 per day. Outbreaks of the past in this area reached a peak in October. This year losses averaged over 200 for one week in October despite herding operations.

Herding activities were terminated on November 11. After nearly 2 weeks of cold weather, with temperatures dropping well below freezing every night, the incidence of botulism finally dropped to the point where herding was no longer required. However, a check on November 23 revealed nearly as many sick birds as were present when herding operations were suspended. This was surprising in view of the fact that the water in the Sink was entirely covered with ice except for small openings which appeared for a brief period on the warmest afternoons. Most of the birds becoming sick in November presumably were getting sublethal doses for very few fresh carcasses were in evidence. Indications are that many of the birds that got sick after cold weather set in recovered. Hundreds of sick gathered in a large flock at the north end of the Pelican Island Marsh where they existed for days with only a few per day dying. Most of them were too lively to catch, but too sick to fly.

Approximately 10 square miles (see map) of the Pelican Island Marsh, Carson Sink and the old Fallon Refuge were affected. Affected to a lesser degree were some 20 more square miles, mostly to the east. To herd such a large area required large scale operations. Herding equipment included an air-thrust boat, rifles, flares, one caliber 50 machine gun, a searchlight and an airplane. No one method or piece of equipment was sufficient in itself.

Several days use of the airplane alone demonstrated that it was impossible to move the ducks without simultaneous harassment from the ground. The birds flew from the plane but seldom got more than a few feet above the water and then settled back down as the plane passed over, frequently circling to continue feeding in the very spot from which they were flushed.

The tool which was found most useful was the caliber 50 machine gun loaned by the National Guard. This was mounted atop Battleground Point (see map), a 30 foot high sand dune overlooking the area. Until the start of the hunting season, single bursts from the gun, starting from the west and working north to east, would almost entirely clean all ducks and geese for a distance of about three miles. Some of the birds moved out into deep water of the



Boundary, Stillwater Wildlife Management Area

1952 BOTULISM OUTBREAK
IN
PELICAN ISLAND AREA

Area most affected by botulism

Land - All else flooded

Carson Sink proper. Others pulled completely out of the area. Unfortunately, still others would move to the east just out of gun range. This was also a danger area, consisting of a series of mud flats. However, losses were small there when compared to the vegetated area of the Pelican Island Marsh. Since this was out of machine gun range, two air-thrust boats were used for herding here and other peripheral areas. Rifles, 30.06, using tracer ammunition, increased the effective range of the boats.

During the first part of the herding period, only one air-thrust boat was available and a combined machine gun, air-thrust boat, airplane herding effort was carried out. The ground activities raised the birds high enough that the airplane could have them well out of danger zones.

The only herding device used at night was one searchlight, which covered but a square mile. The machine gun could not be used after dark because of the danger of hitting livestock. Boat operations after dark were decidedly dangerous because of the shallow water and exposed mud bars. Consequently, the birds turned to feeding at night outside the range of the light. It is felt most of the losses after herding began came from this night feeding. The first crew in the morning would always flush thousands of ducks with the machine gun. More lights should be available for next year, when a re-occurrence of the outbreak is expected.

After the hunting season began on October 17, herding became less effective as hunting pressure forced the ducks to move from other areas.

During the day herding operations could be relaxed and attention was focused at saving some of the sick. A total of 3,281 sick ducks and geese were picked up and hospitalized. Of this number all but 552, or 17%, recovered. The hospital consisted of a fenced area on the bank of the Carson River in the shade of a large willow tree. The pen extended out into the river so that about 50% of the enclosed area was in fresh running water. Feed consisted of barley scattered daily in the edge of the water. A few of the ducks were inoculated with anti-toxin, however, the expense of a large scale treatment did not seem warranted. The usual practice of giving the birds a drink of water with a syringe was not practiced, as they did well on their own. Many birds flew out of the pen as they recovered. Others were banded and taken to the Indian Lakes or the Stillwater Marsh.

It is felt that a large percentage of the botulism losses came from feeding away from shore. The birds did not feed extensively along the shorelines except during the initial stage of the outbreak. Hundreds of carcasses were present up to two miles from land before herding started. The possibility that the first carcasses in the water served as focal points for disseminating the bacteria and toxin

must be considered. Most shorebird losses occurred at the first of the botulism outbreak. For the last six weeks of the outbreak shorebirds fed along shorelines, without being disturbed by the herding activities. Very few shorebirds died during this period, but the ducks which, for the most part, fed away from the shorelines, continued to die. Coots behaved like the shorebirds in soon becoming accustomed to the herding. They fed away from shorelines, and several hundred succumbed, including many late in the outbreak.

During the outbreak, Pelican Island water levels as measured near Battleground Point fluctuated up and down over a three-inch range. The lowest level occurred as a result of heavy winds on September 4 and 5 when total wind movement for the two days was 180 miles. A noticeable increase in sick and dead birds appeared after this wind. Another windy period of lesser intensity occurred from September 9 to 11. Thereafter there were no days when the wind movement exceeded 59 miles for any one 24-hour period.

From hospital records and shoreline counts, losses by species for ducks and geese have been calculated on a percentage basis as follows:

Mallard	8%
Gadwall	1
Baldpate	1
Pintail	43
Green-winged Teal	22
* Cinnamon Teal	3
Shoveller	19
Redhead	1
Ruddy Duck	1
** Others	<u>1</u>
Total	27,000

* May include some blue-winged teal

** Includes Canada geese, snow geese and canvasback

Losses were also found in 19 other bird species. Sample counts indicated losses among other birds were approximately as follows:

Eared Grebe	10
White Pelican	10
Snowy Egret	10
White-faced Glossy Ibis	25
Coot	668
Killdeer	100
Black-bellied Plover	1
Least Sandpiper	85
Dowitcher	75

Western Sandpiper	10
Marbled Godwit	50
Avocet	360
Black-necked Stilt	120
Wilson's Phalarope	10
Northern Phalarope	75
California Gull	10
Ring-billed Gull	30
Forester's Tern	50
Yellow-headed Blackbird	<u>1</u>
Total	1,700

Present indications are that we can expect a re-occurrence of this outbreak next summer. A large lake still exists in the Carson Sink and this lake will almost certainly be augmented by further spillage from Lahontan Reservoir prior to the spring runoff.

4. Lead Poisoning

No losses which could be attributed to lead poisoning were observed.

B. Upland Game Birds

Sporadic use is made of the Area by ring-necked pheasants and California quail particularly where the Area joins private farmland. Several California quail coveys also occur on uncultivated private land along the Carson River. Several pheasants have taken residence in the East Pasture. Five were seen there on October 15.

C. Big Game Animals

A carcass of a doe mule deer was found on the north edge of the Northwest Pond about October 15. The carcass had decomposed, only skin and bones being left. The only previous deer records we have were made along the east side of the Stillwater Marsh.

D. Fur Animals, Predators, Rodents and Other Mammals

1. Fur Animals

A. Muskrat

The results of this year's muskrat inventory showed the third successive increase in a row for the Stillwater Marsh muskrat population. Detailed information on this has been included

in other reports. Although in the past we have relied primarily on the ground census, this year's airplane count was considered a more reliable indicator. The ground census consists of following the marsh perimeter of key ponds and channels with a boat and counting feeding stations and houses. This operation was hampered this year by a strip of dead marsh growth between the open water where the boat runs and live growth where the muskrat sign exists.

Population estimates on the Stillwater Marsh since 1949 are as follows:

1949 - 1,500
1950 - 6,500
1951 - 10,100
1952 - 23,200

B. Other Furbearers

Badgers were seen at scattered locations. A bobcat was seen in the East Pasture on September 8. Raccoon tracks were observed at the south end of the Stillwater Point Reservoir on September 6. Around October 1 "coon" tracks were found in the East Pasture. The only previous raccoon record by us for the Area was based on tracks observed on the east side of the Stillwater Point Reservoir on January 20, 1950.

2. Predators

A few coyotes exist on the Area, although their numbers are not of alarm proportions. At least three hunt the Reservoir-Foxtail Lake area. Others use the desert and Pelican Island area.

3. Rodents

Rodent Control. A rodent control program was started this fall in the East Pasture. A population of rodents, particularly kangaroo rats had built up until the contour dikes were riddled with burrows. During one irrigation we found 5 leaks in a fourth mile of contour dike which had resulted from the burrowing activity. It appears now that rodent control will become an annual program unless cattle grazing results in a decrease in the rodent population. On October 17 we treated approximately 10 miles of contour dike covering an affected area of some 180 acres. Seventy pounds of strychnine oats were used. The kill was estimated at about 90%. Part of the pasture was not irrigated after the poisoning and some of the rodents had moved into the fields thereby failing to find the grain. To date, the pasture has not been grazed so that an abundance of grass and legume seeds were naturally present.

Porcupine. On December 20, Biologist Marshall and the Refuge Manager observed two porcupines on the edge of the lower Carson River between Timber Lake and Smallwood's Cabin. One was on the east side of the river in a cottonwood tree where it had been feeding. The other was in a willow tree across the river. Several other willow trees were observed that had been heavily barked by the second porcupine. The presence of these porcupines constitutes a new record for the Management Area.

Field Mice. One other rodent observation is of importance. The Nutgrass Unit, which has been dry for more than a year, is swarming with field mice (*Microtus*). There are approximately 2,400 acres of marsh cover in this unit, including alkali bulrush, cattail and saltgrass border, and all of it is supporting a dense mouse population. Over much of the area, particularly that covered by saltgrass and bulrush, the actual ground level has been elevated from 3 to 6 inches by castings from the burrowing activities. The Nutgrass Unit has become a happy-hunting-ground for marsh hawks and short-eared owls, but the presence of dense marsh cover has prevented these raptors from taking more than a token share of the available supply.

E. Predaceous Birds

Prairie falcons were seen even more frequently than previously. Biologist Marshall recorded five observations on prairie falcons for the period last year, while eight were made this year for the period. None were seen in the fall of 1950. Both golden and bald eagles occurred along the Carson River toward the latter part of the period. Magpies were occasionally seen along the Carson River, in the Indian Lakes area and in trees along the canal leading to Foxtail Lake from the Stillwater Service Building. Five was the greatest number seen at any one time. Ravens fed on botulism victims along with vultures at Pelican Island. The largest number recorded at any one time was 30.

F. Fish

We have yet to receive a report from the State on work conducted on Stillwater black bass populations by Fisheries Technician Tom Trelease. It is a little difficult, therefore, to do justice to this section of the narrative. Trelease's work is still in a preliminary phase so that perhaps some written information will be made available in the future. Information obtained from talks with Trelease and from a speech presented to the local sportsman's organization revealed that the study has pertained largely to growth rate and age class distribution.

One interesting outcome of the study was the discovery of blue-gill sunfish in the Stillwater Marsh. This fish is apparently common yet its existence was previously unknown.

III DEVELOPMENT AND MAINTENANCE

A. Physical Development

Road Construction. During this period the building of roads was confined to work on the North Road which extends along the north side of the marsh between the West County Road and the end of the Swan Lake Dike. Most of the work is being done by the elevating grader but it has been necessary to use the 8-yard carryall on low, wet ground and the P&H dragline on one 400-foot water crossing. Normally, this road could have been built in its entirety with the elevating grader, but high water conditions made that impossible.

The specifications for the North Road are the same as for other roads built on the Management Area. The road is 16 feet wide with a 2-foot crown elevation except for ground depressions where the fill is built to a definite grade line.

Work accomplished to date may be summarized as follows:

Stations	0+00 to 205+00	- 20,500 feet, fill and grade complete
Stations	205+00 to 252+00	- 4,700 feet, under construction by elevating grader
Stations	252+00 to 278+00	- 2,600 feet of sandhills, construction completed
Stations	278+00 to 282+00	- 400 feet, water crossing, basal fill cast by P&H dragline
Stations	282+00 to 305+48	- 2,348 feet, fill and grade complete

Work remaining to be done includes the 4,700-foot segment now under construction and additional elevation of 400-foot water crossing which will have to wait until the basal fill is dry enough to support equipment.

Dike Construction. The only dike work in progress is that of riprapping with rock the Nutgrass Dike. At least half of the work expended to date has involved the construction of the 8-mile haul road from the rock pit. Three miles of new road had to be built while 5 miles of the total had to be surfaced with gravel in order to keep it in passable shape. Before the winter is over we will undoubtedly have to gravel the remaining 3 miles of haul road so that it will be usable in wet weather, but we have postponed this job for the time being in order to get started with the riprapping.

There is considerable urgency in getting the north side, at least, of the Nutgrass Dike riprapped. The Carson Sink, normally dry, still retains a lake of perhaps 70,000 acres as a result of the 1952 runoff. At the present time this lake is rapidly expanding. Over 300 second feet of power water is being dumped into the lake via the Carson River. Also, there is some inflow still from the flooded Humboldt Sink. This additional water in itself is very probably

enough to swell the lake to such proportions that by the end of the winter it will be washing against the Nutgrass Dike. It is very probable also that the Irrigation District will have to dump water from Lahontan Reservoir. This reservoir is nearly full because of the record runoff in 1952, and room will have to be made for the runoff this coming spring. Any extensive dumping will tend to accelerate the spread of the Carson Sink lake.

Actual riprapping of the Nutgrass Dike started on November 24. Between that time and the last of December 5,400 lineal feet of dike slope was riprapped. The material used was cobblestone of various sizes mixed with a certain amount of gravel and sand. The cobblestone occurs in a beach deposit. It tends to be concentrated in pockets so that some sorting is necessary. The finer material is set aside for use as dike surfacing material. Approximately 1,200 feet of dike has been surfaced in order to dispose of some of this material.

Canal Excavation. Excavation of the Lead Lake Canal was finished November 4. This job will not be complete, however, until the spoil banks can be built higher and wider on sections that traverse low ground. Canal cuts were so shallow in such places that there was very little spoil. In several places, already, adjacent marsh water has cut these banks and is now continuous with the water in the canal. Overflow water from the marsh which has filled one swale through which the canal passes is now 30 inches deep against the canal banks.

Near the west end 2,500 feet of bank needs to be built up. On the west approach to the inverted siphon another 800 feet of bank has to be elevated. On this latter segment, both north and south banks will require additional fill.

Pasture Development. The only work accomplished during the period was on the East Pasture. The newly constructed portion, consisting of 232 acres, was seeded with rye and fall wheat. This planting was completed on September 25. It was subsequently irrigated 3 times before the end of the growing season.

As a whole, the new planting got off to a good start. Crusting of the surface soil was much less noticeable than during spring plantings. By the time of the last irrigation the ground was well carpeted with young green plants. During that irrigation Canada geese started feeding on the grain and stayed with it until it was gone. At present there is not a green shoot to be found. This grazing does not appear to have caused any damage though some plants may have been pulled while the ground was wet. Much of the new growth was merely clipped off at the surface of the ground.

The newly developed and seeded portion of the pasture caused more trouble and work than anticipated. Contour dikes and lateral banks had just been completed prior to planting and irrigation so

that the dirt was still soft and uncompacted. As a result considerable sloughing and settling occurred with the irrigations. Considerable time was spent with the P&H dragline and dump trucks building up sections that settled below grade or washed excessively. Additional riprap was required at some of the structures.

Structure Work. Structure No. 17 has been bridged and the P&H dragline was used to tie the structure in to the Nutgrass Dike. Work remaining to be done includes final backfilling which will be done with truck hauled material and riprapping. This structure, located exactly in the center of the Nutgrass Dike, will serve as the outlet to the Nutgrass Unit and also as one of the two outlets for surplus marsh water.

Equipment. In the previous narrative we discussed the air-thrust boat under construction in the refuge shop. This boat was completed on September 27 and put into immediate operation. From that date until botulism herding activities were terminated on November 10, the boat was run for a total of 173 hours.

Repair of Equipment. The Lima dragline remains idle at the shop. Parts for the truck assembly, ordered last July, have not been received. We had been advised that part of the order would be delivered in 30 days but that a full year would be required to complete the order. We now learn that it will be February before the first shipment of parts is made.

The Caterpillar D-6 Angle Dozer, received from Ruby Lake, was overhauled with new track rollers being installed.

The head gasket was replaced on the Allis Chalmers Tractor, HD-14, 995, and repairs were made to the hydraulic dozer pump.

New track rail assemblies have been ordered for HD-14, 1042.

A new short block assembly was installed in the 1939 Chevrolet Dump, I-16176.

B. Plantings

1. Aquatic and Marsh Plants - None
2. Trees and Shrubs - None
3. Upland Herbaceous Plants - None
4. Cultivated Crops

In the East Pasture 8002 pounds of Winter Wheat and 1235 pounds of Fall Rye were used to seed 232 acres.

C. Collections

The male black-bellied plover, still in breeding plumage, picked up at Pelican Island, a victim of botulism, on August 27, was sent to the National Museum as a study skin.

D. Receipts of Seed and Nursery Stock

On October 7 we received 50 pounds of Elaecharis quadrangulata seed from the Mattamuskeet Refuge, New Holland, North Carolina.

On December 2 we obtained 180 pounds of millett from the Sacramento Refuge, Willows, California.

IV ECONOMIC USE OF REFUGE

A. Grazing

As brought out in the last narrative report, grazing conditions during the past season were the best in years. Destruction of waterfowl food by livestock at Pelican Island was not nearly as heavy as in previous years. Probably one-third of the alkali bulrush there remained untouched, which is unusual. By October, however, the cattle had eaten down the clumps of hardstem bulrush that appeared during the summer.

Special Use Permits issued for grazing and the AUM's utilized during the year are listed on the NR-10 form.

B. Haying - None

C. Fur Harvest

A quota of 12,000 muskrats has been set for removal this winter. However, trappers got off to a bad start because of ice in November and most of December. The ice seldom covered more than 50% of the area, but was sufficient to prevent the use of boats. This condition prevented more than token trapping during the fall, and we will have to depend on spring trapping to remove the major portion of the muskrat quota.

D. Timber Removal - None

E. Other Uses - None

V FIELD INVESTIGATION AND RESEARCH

None

VI PUBLIC RELATIONS

A. Public Uses

1. Hunting Use

This is discussed under Section D, "Hunting." Total hunter days is estimated at 2,850.

2. Fishing Use

Fishing pressure was considerably below that of last spring, when a record number of people suddenly "caught on" to bass fishing in the Millen Landing area. Bass catches were smaller than those of last spring and the fish averaged smaller in size. Catfish and bullhead fishing was poorer than a year ago. Fishing pressure for the calendar year was estimated at 3,300 visitor days compared to 2,500 for 1951. In addition to the Millen Landing area, fishing also took place in the Indian Lakes and along channels from the Stillwater Point Reservoir to Goose Lake.

3. Miscellaneous Use

Under this category comes picnicing and sightseeing, which made up an estimated 500 visitor days.

B. Refuge Visitors

- September 4 - Marselle Leake, Malheur Refuge, delivered a Reo dump truck and picked up the Malheur transport.
- September 13 - Pilot Biologist Ray Glahn, spent three days on
and 15 waterfowl herding in the Pelican Island botulism area.
- September 14 - Howard Sargeant, Assistant Regional Refuge
and 15 Supervisor and Dr. L. C. Morely, spent two days at Stillwater on investigation of our pasture development.
- September 17 - Colonel Norton, Nevada National Guard, gave instruction in use of the 50 caliber machine gun.

- September 19 - Chet Piazzo and Cactus Tom, Reno, at Pelican Island and tape recorded a radio program with sound effects of our duck herding.
- September 22 - Nils Nilsson, PR Coordinator, conferred on botulism control.
- September 23 - Bill Griswold, Assistant Director, Nevada Fish and Game Commission, spent the day at Pelican Island on the botulism control program.
- September 26 - Nils Nilsson and Don Johnson, State Pilot-Biologist, spent the day at Pelican Island on botulism control.
- October 7 - Refuge Manager Thomas C. Horn, Tule Lake, stopped on his way to San Diego and borrowed our tow bar to enable him to take delivery of a surplus pickup.
- October 13 - Phil Hilbel and Harry Richards of Truckee-Carson Irrigation District, spent the day on a pasture tour.
- October 19 to 29 - Russell Wilson, Malheur Refuge, spent this time at Stillwater on an assignment to work on our trespass livestock problem.
- October 20 - Ray Glahn was in on the aerial waterfowl census.
- October 22 - John Chatten, Assistant Regional Supervisor of Game Management made an inspection trip over the Management Area.
- November 6 - William Taylor, Kenneth F. MacDonald and Lee R. Jacoby spent the day on an inspection of the Area.
- November 19 - Fred Wright and Wallace Rabenstein, State Fish and Game Engineer, spent the day in the office on construction specifications.
- November 20 and 21 - Ray Glahn, spent two days at Stillwater making an aerial muskrat house count.
- November 24 - *Hobart* Herbert Brownell, Hollywood photographer, spent the day taking pictures of waterfowl on the refuge.
- November 28 - Leonard Springer, PR, and Fred Wright made a tour of the Stillwater Wildlife Management Area.
- December 8 - Wallace Rabenstein, State Fish and Game Engineer, cooperated on pasture survey.

December 20 - Ray Glahn was at Stillwater making a waterfowl survey.

C. Refuge Participation

- September 8 - Refuge Manager Giles attended a TCID Board meeting relative to pasture development.
- September 28 - The Refuge Manager conducted a tour of Pelican Island and the Stillwater development. In attendance were 20 sportsmen representing 6 western Nevada cities.
- October 9 - Biologist Marshall participated in a wildlife discussion program on radio station KOH, Reno, Nevada.
- November 3 - Biologist Marshall and Refuge Manager Giles presented slides and a talk concerning Stillwater development to Washoe County Sportsman's Organization in Reno at 8:00 p.m. Approximately 200 were in attendance.
- November 13 - Refuge Clerk, Ila Cress, and Refuge Manager Giles attended GSA meeting in Reno. Program was devoted to excess property disposal and procurement.
- November 28 - Biologist Marshall and Refuge Manager Giles attended a meeting of the Stillwater Advisory Committee including representatives of the Fish and Wildlife Service, State Fish and Game Commission, Truckee-Carson Irrigation District and sportsmen.
- December 8 - Refuge Manager Giles attended TCID Board meeting for discussion of grazing fees.
- December 8 - Biologist Marshall presented slides of Stillwater development to Churchill Fish and Game Unlimited.
- December 20 - Biologist Marshall and Refuge Manager Giles made the Christmas Bird Count.

D. Hunting

The waterfowl hunting season began on October 17 and ended December 25. Hunting conditions in the Stillwater Marsh were similar to those of last year. In addition to the Stillwater Marsh, hunting also took place in the Indian Lakes and at Pelican Island. Hunting was probably best at the latter location for those willing to run the chance of getting stuck in the sand and also willing to wade considerable distances.

The State, again, operated a checking station on the Stillwater Road. Although it was operated only on certain weekends this year, and some non-cooperative hunters went around it, it is estimated that 55% of the hunters were checked. The estimated number of hunters for the Stillwater Marsh, their success ratio and birds killed since 1950 follows:

<u>Year</u>	<u>Hunter Days</u>	<u>Kill</u>	<u>No. Birds Per Man-Day</u>
1950	2021	3496	1.73
1951	1956	4342	2.22
1952	2580	5728	2.22

These figures differ considerably from those given in the September-December, 1951, narrative because they do not include data from the Canvasback Gun Club, which was previously combined with Stillwater Marsh Public Hunting Area data. No check was made on the Indian Lakes and Pelican Island kill.

This year's duck kill for the entire Stillwater Marsh, including the Canvasback Gun Club, broken down on a percentage basis as compared to 1951, was as follows:

<u>Species</u>	<u>1951</u>	<u>1952</u>
Shoveller	25%	28%
Pintail	22	17
Gadwall	14	16
Mallard	12	16
Green-winged Teal	12	10
Canvasback	4	2
Redhead	4	6
Baldpate	4	3
Ruddy Duck	1	1
Cinnamon Teal	Trace	1
Scaup	Trace	Trace
Bufflehead	Trace	Trace
Golden-eye	Trace	Trace
Others	Trace	Trace

Excluding the Canvasback Gun Club, the breakdown would probably not be greatly different from the above.

Actually checked were 74 snow geese, 48 Canada geese, two white-fronted geese and 58 coots. There is no way of determining what percentage of these were actually taken on the Management Area exclusive of private land.

E. Fishing Success

This was discussed under Public Uses of the Area.

F. Violators

The following cases were made on the Management Area by Howard Cantrell, Game Management Agent.

George I. Coslow - 11/8/52, late shooting; fined \$100
 Carrol B. Hunt - 11/8/52, late shooting; fined \$100
 Joseph H. Engleman - 12/7/52, late shooting; fined \$50
 Edwin L. Stephens - 12/7/52, late shooting; fined \$50

VII OTHER ITEMS

At the end of the period the State construction crew, Pittman-Robertson employees on the cooperative development program, consisted of the following:

- 1 - Motor Patrol Operator
- 2 - Dragline Operators
- 1 - Rodman-Chairman
- 3 - Oilers
- 1 - Elevating Grader Operator
- 2 - Tractor Operators
- 1 - Concrete Crew Foreman
- 1 - Irrigator
- 1 - Laborer
- 5 - Truck Drivers

ANAHO ISLAND

No trips were made to this refuge
during this period.

ANAHO ISLAND NATIONAL WILDLIFE REFUGE

FALLON NATIONAL WILDLIFE REFUGE

FALLON REFUGE

The Fallon Refuge joins the Stillwater Wildlife Management Area and takes in portions of the Pelican Island Marsh and Carson Sink. Since neither we nor the ducks know where the boundary between these two areas actually lies on the ground, we have combined everything pertaining to the Fallon Refuge with the Stillwater report in various sections where Pelican Island is mentioned.

In the last narrative we mentioned that a colony of Caspian terns was noted on one of the small islands out in the inundated flat of the Carson Sink. This colony was first noted from an airplane. At the last of September the island was visited by air-thrust boat at which time we learned definitely that the terns had nested there. Even at that late date 4 downy young were observed.

WINNEMUCCA NATIONAL WILDLIFE REFUGE

WINNEMUCCA LAKE REFUGE

No trips were made to this refuge
during this period.

This report was prepared by LeRoy W. Giles, Refuge Manager and David B. Marshall, Biologist.

Photography credit is given to Mr. Marshall for the pictures included herein.

The following NR forms are not applicable to the Area through this report period:

NR 3 - Big Game
4 - Small Mammals
11 - Timber Removal

Submitted January 28, 1953

LeRoy W. Giles

LeRoy W. Giles
Refuge Manager

APPROVED:

(1) Species Common Name	(2) First Migrants Seen		(3) Peak Concentration		(4) Last Migrants Seen		(5) Young Produced		(6) Total for Period Estimated Waterfowl Days
	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	
1. <u>Swans:</u> Whistling swan	4	10/29	4,100	12/8					102,291
2. <u>Geese:</u> Canada goose Cackling goose Brant White-fronted goose Snow goose Blue goose	1	9/4	3,100 6,750	11/28 10/26					115,128 287,896
3. <u>Ducks:</u> Mallard Black Duck Gadwall Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveller Wood duck Redhead Ring-necked duck Canvas-back Scaup Golden-eye Buffle-head Ruddy duck American Warganser			15,500 5,400 4,400 20,800 13,700 6,200 26,300 900 1,400 40 40 150 700 1,200	10/30 11/7 10/30 10/30 11/7 9/4 11/7 9/29 10/30 11/21 11/21 11/28 11/7 12/27	3	11/23			817,078 223,171 275,363 1,248,368 704,460 151,843 1,307,543 35,195 63,709 380 1,070 5,089 34,019 10,424
4. <u>Coot:</u>			45,400	9/4					2,772,461

SUMMARIES

Total Production:

Geese_____

Ducks_____

Coots_____

Total waterfowl ^{days use}~~usage~~ during period 8,102,488

Peak waterfowl numbers 105,836

Areas used by concentrations Stillwater Point Reservoir,
Pelican Island Marsh

Principal nesting areas this season_____

No. of inventories this period - 13 % of refuge covered - 30
Reported by David B. Marshall

INSTRUCTIONS

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance.
- (2) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) Peak Concentration: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned in the reporting period.
- (5) Young Produced: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Stillwater F. M. AreaMonths of September to December 1945

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Sared Grebe			200	10/7	26	11/7				300
Western Grebe			1,500	9/29	11	11/7				1,500
Pied-billed Grebe			300	Sept.						300
White Pelican			2,000	9/4	2	11/28				3,000
Double-crested Cormorant			60	10/7						100
Great Blue Heron			600	Sept.						600
American Egret			15	10/14						15
Snowy Egret			700	9/4						700
Black-crowned Night Heron			700	9/4						700
American Bittern			100	Sept.						100
Least Bittern			2	Sept.	1	9/25				2
White-faced Glossy Ibis			150	9/4	1	11/8				150
Virginia Rail			100	Sept.						100
Sora			300	Sept.						300
II. Shorebirds, Gulls and Terns:										
Killdeer			200	Sept.						300
Black-bellied Plover	1	8/27			1	8/27				25
Willet	2	12/20	2	12/20	2	12/20				2
Greater Yellow-legs			20	10/22	1	11/28				30
Pheps (Least & W. Sandpipers)			10,000	9/4						20,000
Dowitcher			500	Oct.	7	11/28				1,000
Marbled Godwit			100	Oct.	8	12/8				150
Avocet			1,500	9/4	3	11/28				1,500
Black-necked Stilt			10	9/4	10	9/4				10
Northern Phalarope			1,000	Sept.	1	10/22				1,000
Ring-billed Gull			200	Sept.						200
Caspian Tern			10	Sept.	4	10/7				10

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow Prairie Falcon		3 15 40 6	12/20 Dec. 11/18 Entire Period	3 12/20	5 25 50 6
Reported by..... David B. Marshall					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752

Form NR-2

(April 1946)

UPLAND GAME BIRDS

161

Refuge Stillwater R. M. AreaMonths of October 1 to December 31, 1942

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
California Quail									50	Intermittent use of Area
King-necked Pheasant									20	Intermittent use of Area 5 in East Pasture

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

Refuge Stillwater W. N. AreaYear 1945

Botulism

Lead Poisoning or other Disease

Period of outbreak July 1 - November 15

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	<u>2887</u>	<u>27,650</u>
(b) Shorebirds	<u>294</u>	<u>1,000</u>
(c) Other	<u>10</u>	<u>50</u>

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	<u>2729</u>	<u>83</u>
(b) Shorebirds	<u>0</u>	<u> </u>
(c) Other	<u>0</u>	<u> </u>

Areas affected (location and approximate acreage) 20,000
Acres; Pelican Island Marsh, Carson Sink, Sand Dune Area
North of Pintail Bay.

Water conditions (average depth of water in sickness
 areas, reflooding of exposed flats, etc.)

Depth up to 1 foot. Reflooding of mud flats during
windy periods

Condition of vegetation and invertebrate life _____

Abundant and actively growing during seasonRemarks Covered in detail in body of report

Kind of disease _____

Species affected _____

Number Affected

Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

Refuge Stillwater Wildlife Management AreaYear 1952

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
Bullhead	Common	3,300	2,000			None		None
White Catfish	Few		200					
Carp	Abundant		0	1	20,100 lbs.			
Large-mouth Bass	Common		2,500			24	Indian Lakes	
Yellow Perch			0					
Sacramento Perch			0					
Blue-gill Sunfish			0			16	Indian Lakes	

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Stillwater Wildlife Management Area Year 1945

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
<i>Scirpus Olneyi</i>	Swan Lake and Pintail Bay Dikes	1 Clump per 10'	175 yds. shoreline	Root Clumps	3/12/52	9%	Destroyed by Muskrats	
<i>Scirpus Acutus</i>	Pintail Bay Dry Lake Doghead Pond	6-8 plants at 1/4 mi. intervals		275 Root clumps	3/27 - 4/7/52	9%	Water too deep	
<i>Allenrolfea occidentalis</i>	Pintail Bay Dike		1300 yds. shoreline	Young Plants	3/14/52	9%	Planted too high	Nesting cover on Dike

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Stillwater N. H. Area Year 1952

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Loca- tion	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
							Harvested		Unharvested		
					Acres	Bu. Har- vested	Acres	Bu.	Acres	Bu.	
Refuge Personnel		East Pasture	Pasture								Used by wildlife only

[illegible]

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or Location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis indicate the total cash revenue received by the Service.

3-1570
NR-8a

REFUGEE GRAIN REPORT

Refuge Stillwater Wildlife Management Area

Months of October 1 thru December 31 1952

(1)	(2)	(3)	(4)	(5)				(6)	(7)		
	ON HAND	RECEIVED		GRAIN DISPOSED OF				ON HAND	PROPOSED USE		
VARIETY	BEGINNING OF PERIOD	DURING PERIOD	TOTAL	TRANS- FERRED	SEEDED	FED	TOTAL	END OF PERIOD	SEED	FEED	SURP.
Barley	293	0	293					293	293		0

(8) Indicate shipping or collection points.....

(9) Grain is stored at Headquarters yard, Stillwater Refuge

(10) Remarks.....

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lbs., Corn (ear)—70 lbs., Wheat—60 lbs., Barley—50 lbs., Rye—55 lbs., Oats—30 lbs., Soy Beans—60 lbs., Millet—50 lbs., Cowpeas—60 lbs., and Mixed—50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately: Corn, wheat, proso millet, etc. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share-cropping, or harvest from food patches.
- (4) A total of Columns 2 and 3.
- (6) Column 4 less Column 5.
- (7) This is a proposed breakdown by varieties of grain listed in Column 6.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters grainary", etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

3-1759
Form NR-9
(April 1946)

COLLECTIONS AND RECEIPTS OF PLANTING CHECK
(Seeds, rootstocks, trees, shrubs)

Refuge Stillwater Wildlife Management Area Year 19452

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
Millet					180 lbs.	Sacramento Refuge	180 lbs.	0
Eleocharis Quadrangulata					50 lbs.	Mattamuskeet Refuge	50 lbs.	0

3-1760
Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge Stillwater Wildlife Management Area Year 1952

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Carl E. Flocher	STI-1	Mgt. Area		350		4/8 - 10/31/52	.25	25.00	Deposit Only
Ray Emerson	STI-2	Mgt. Area		204		4/1 - 9/30/52	.25	51.00	
Daniel Casey	STI-4	Mgt. Area		600		4/1 - 10/31/52	.25	50.00	Deposit Only
Michael Casey	STI-5	Mgt. Area		430		4/1 - 10/31/52	.25	37.50	Deposit Only
Sam Hilbel	STI-7	Mgt. Area		55		4/3 - 10/31/52	.50	27.60	
Sam Hilbel	STI-8	Mgt. Area		247		4/3 - 10/31/52	.25	61.87	
Edmund Casey	STI-14	Mgt. Area		525		4/21 - 10/31/52	.25	25.00	Deposit Only
Clyde Hilbel	STI-26	Mgt. Area		80		5/1 - 10/31/52	.25	20.00	
James Sloan	STI-11	Mgt. Area		455		4/17 - 10/31/52	.25	40.00	Deposit Only
Howard Wolf	STI-12	Mgt. Area		30		4/17 - 10/31/52	.25	7.50	
John Mussi	STI-3	Mgt. Area		787		5/1 - 9/15/52	.25	196.88	
Joe Serpa	STI-6	Mgt. Area		696		4/15 - 10/31/52	.25	174.00	
Tom Brackney	STI-9	Mgt. Area		55		4/5 - 9/30/52	.50	28.00	
John Schmaling	STI-16	Mgt. Area		100		4/22 - 10/31/52	.25	10.00	Deposit Only
Howard Austin	STI-18	Mgt. Area		900		4/29 - 10/31/52	.25	75.00	Deposit Only
William Harba	STI-19	Mgt. Area		181		5/1 - 10/12/52	.25	45.33	
Robert Erb	STI-20	Mgt. Area		40		6/19 - 10/31/52	.25	3.25	Deposit Only
Frank Erb	STI-22	Mgt. Area		28		4/1 - 10/31/52	.50	14.00	
Harold Freeman	STI-24	Mgt. Area		28		4/1 - 10/31/52	.50	14.00	

Totals:

Acreage grazed 80,000 Animal use months 5,791 Total income Grazing 905.93
Acreage cut for hay _____ Tons of hay cut _____ Total income Haying _____



M-422. Aerial view looking north over a sizeable portion of the Stillwater Marsh. Goose Lake Unit (Pool 3877) right foreground with Lead Lake Canal running into the north end of it from the left, across the main land mass. "D" Diike, Swan Lake Diike and Pintail Bay Diike shown in right center. Flooded sand dune area, outlet from Pintail Bay into the flooded Carson Sink (background), shown in upper right. 11/21/52



M-427. Lorain Dragline loading riprap for Nutgrass Diike. 12/11/52



M-429. Unloading riprap along the Nutgrass Dike.

12/11/52



M-430. Looking east from Structure No. 17 along the Nutgrass Dike showing completed riprap on north side of dike.

12/11/52



M-431. Refuge constructed air-thrust boat and trailer. 12/11/52



M-409. Stillwater Refuge built air-thrust boat in action. 10/5/52



M-423. Aerial view of Pelican Island Marsh and Carson Sink (flooded). Timber Lake right foreground. Carson River and sloughs run across lower half of photo. Pelican Island shows as a sand dune island in left center. 11/21/52



M-411. Ducks, dead from botulism, piled along Pelican Island Marsh shore. 10/5/52



M-4.07. 9/30/52



M-4.16. 10/12/52

These two typical views of Pelican Island Marsh habitat show why such a sizeable portion of Stillwater's waterfowl are attracted to Pelican Island, where botulism prevailed most of this period. Upper photo, with cattle, contained an interspersation of hardstem bulrush, knot-grass (*Paspalum distichum*), saltgrass and open water with horned and sago pondweeds. Lower photo shows alkali bulrush stand.



M-401. This 50 calibre machine gun borrowed from the National Guard and mounted atop Battleground Point, a sand dune overlooking the Pelican Island Marsh, was nearly 100% effective in herding ducks and geese within a 3 or 4-mile radius. It out-herded all other herding devices (airboat, rifles, flares and airplane) combined. 9/13/52



M-417. Pen where sick ducks and geese were placed and 85% recovery effected. Water body is Carson River which has substantial current at this point; trees offered shade. 10/28/52



M-413. Mud flats along south edge of Carson Sink which water covered intermittently. Two dead ducks in foreground. 10/11/52



M-404. Part of "Show-me" Group which toured botulism area and Stillwater Marsh. Shown here at machine gun used for herding. 9/28/52



M-420. Aerial view of muskrat houses in cattail along edge of Foxtail Lake. Line through cattail is site of former road which crossed the lake when dry. A corner of the East Pasture shows at the upper right. 11/21/52